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INSTRUMENTATION IN THE LAB

Electronic instrumentation is becoming more and more common in the organic lab, a change that is both good and bad. The good part is that you'll be able to analyze your products, or unknowns, much faster, and potentially with more accuracy than ever. The bad part is that you have to learn about how to use the instrumentation, and there are many different manufacturers of different models of the same instrument.

Even worse in this respect is the introduction of computer-controlled instrumentation in the laboratory. Assuming the computer that drives the instrument is an IBM-compatible (many aren't), which compatible is it? An XT? A 286 AT? A 386? A DOS or OS/2 operating system? And then there's the software that drives the instrument. Is it all mouse-driven? What keystrokes mean what? I use a Mattson Galaxy model 2020 **Fourier transform infrared (FTIR)** instrument. I'm familiar with the Perkin-Elmer model, too. These two models look different, their computers are different, and their software is *really* different. I can't justify to myself the inclusion of one model over another because they are so different. (Yes, I have a Perkin-Elmer 710B as an example of a dispersive instrument, but dispersive instruments have more things in common than FTIR's.) So, unless someone has a really good approach and would like to tell me about it, I'll just have to think about it a bit more.

The usual textbook approach is to take a piece of equipment, say something like "This is a typical model," and go on from there, trying to illustrate some very common principles. But what if your equipment is different? Well, that's where you'll have to rely on your instructor to get you out of the woods. I'm going to pick out specific instruments as well. But at least now you won't panic if the knobs and settings on your instrument are not quite the same.

With that said, I'd like to point out a few things about the discussions that follow.

1. If you just submit samples to be run on various instruments, as I did as an undergraduate, pay most attention to the **sample preparation** sections. They say little more than "Don't hand in a dirty sample," but often that's enough.
2. If you get to put the sample into the instruments yourself, **sample introduction** is just for you.
3. If you get to play with (in a nonpejorative sense) the instrument settings, you'll have to wade through the entire description.

You'll notice that I've refrained from calling these precision instruments "machines." That's because they *are* precision instruments, not machines—unless they don't work.